

Application No.: 10/650,412

Docket No.: HO-P02190US1

**AMENDMENTS TO THE CLAIMS**

Claims 1-19 (Canceled)

20. (canceled)

21. (currently amended) The apparatus of claim 20-22 further comprising means, incorporated in said cell growth chamber, for cell growth, wherein one or more components of the apparatus are constructed of a gas permeable film or membrane such that CO<sub>2</sub>-buffered media can be used in the cell growth chamber and oxygen may permeate to the cells for their metabolism during growth.

22. (currently Amended) An apparatus microfabricated for performing cell growth and/or cell based assays in a liquid medium, said apparatus comprising:

a) a base plate supporting a plurality of micro-channel elements, each comprising a cell growth chamber, an inlet channel, and an outlet channel;

b) a cover plate positioned over said base plate said cover plate extending over said elements so as to define said chambers and channels; and

c) a hydrophobic valve in at least one of said chambers or said channels that is defined by positioning said cover plate over said base plate. The apparatus of claim 20, wherein said valve comprises a localized region of hydrophobicity within said chamber or said channel.

23. (currently amended) The apparatus of claim 20-22 further comprising a suspension of cells to be grown in each of said cell growth chambers.

24. (Previously presented) The apparatus of claim 23, wherein said cells require attachment to said cell growth chambers for growth.

25. (currently amended) The apparatus of claim 20-22, wherein said base plate comprises a rotatable disc which is microfabricated to provide a sample introduction port located towards the center of the disc and connected to an annular sample reservoir, and wherein said micro-channel elements are radially dispersed on said disc with their respective input channels connected to receive sample from said reservoir.

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26. (currently amended) The apparatus of claim 2022, wherein said cover plate is fabricated from a gas permeable plastic material.

27. (Previously presented) The apparatus of claim 26, wherein the plastic material is a silicone polymer, polyurethane or polytetrafluoroethylene.

28. (Previously presented) The apparatus of claim 27, wherein the silicone polymer is polydimethylsiloxane.

29. (Previously presented) The apparatus of claim 21, wherein said means for cell growth comprises at least a portion of a surface of said cell growth chamber that is treated to allow for cell attachment.

30. (Previously presented) The apparatus of claim 29, wherein said surface is negatively charged surface.

31. (Previously presented) The apparatus of claim 29, wherein said surface comprises a coating of polylysine, collagen or fibronectin.

32. (Previously presented) The apparatus of claim 21, wherein said means for cell growth comprises one or more microcarrier beads located in said cell growth chamber, wherein each of said microcarrier beads provides for cell attachment.

33. (currently amended) The apparatus of claim 2022, wherein said cell growth chamber comprises raised moulded features disposed on the base portion of said cell growth chamber to form pillars.

34. (currently amended) The apparatus of claim 2022, wherein the cross-sectional area of said inlet channel is greater than that of said outlet channel.

35. (Previously presented) The apparatus of claim 34, wherein the cross-sectional area of said outlet channel is between 0.99 and 0.01 times that of said inlet channel.

36. (currently amended) The apparatus of claim 2022, wherein at least some of said micro-channel elements each comprises one or more assay chambers for performing assays

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involving cellular constituents and connected in line between said cell growth chamber and said outlet channel.

37. (Previously presented) The apparatus of claim 36, wherein each assay chamber is connected to each other and to said cell growth chamber by an intermediate channel in the order of: inlet channel, cell growth chamber, intermediate channel, assay chamber, outlet channel, and wherein the cross-sectional areas of the respective channels reduce progressively from the inlet channel to the outlet channel.

38. (Previously presented) The apparatus of claim 37, wherein the cross-sectional area of each intermediate channel and the outlet channel is between 0.99 and 0.01 times that of the immediately preceding upstream channel.

39. (Previously presented) The apparatus of claim 37, wherein there is provided in or on an interior surface of one or more of said chambers a layer comprising a scintillant substance.

40. (Previously presented) The apparatus of claim 39, wherein the layer comprising a scintillant substance comprises a binding moiety bound thereto, said binding moiety being a member of a specific binding pair selected from the group consisting of biotin, streptavidin, protein A, antibodies, lectins, hormone-receptors, nucleic acid probes, and DNA-binding proteins.

Claims 41-52 (Canceled)